



MODEL K-702

TWO WIRE
PRESSURE TRANSMITTER
BIS Certified

OPERATION

AND

INSTRUCTION MANUAL



Switzer Instrument Limited

Regd. Off: 29 (Old# 14), Thanikachalam Road, P.B.No.1423, Chennai 600 017

Internet web-site
www.switzerinstrument.com

Sales – Head Office

17 (Old# 9), South Boag Road, Chennai 600 017

Ph : 044-24340999 / 24343956 / 24344321

Fax : 044-24347887 e-mail : sales@switzerinstrument.com

Works

127 Sidco Estates, Chennai 600 098

Ph : 044-26242244 / 26242255 / 26243355

Fax : 044-26248849 e-mail : works@switzerinstrument.com

INTRODUCTION

SWITZER Series K-702 Pressure Transmitters offer economical alternative to conventional transmitters without compromising either accuracy or performance to measure gauge pressure of liquids, gases and vapours. The process pressure is converted into standard analog dc signal of 4-20mA current proportional to the input pressure.

The transmitter utilize latest thin film technology and high stability electronics resulting in exceptional performance and endurance.

These transmitters are housed in cast aluminum enclosures which are weatherproof / flameproof for use in hazardous industrial environment and are certified by BIS for use in explosion proof applications.

PRINCIPLE OF OPERATION

The primary pressure sensing element for the detection is a silicon wafer on which ion implanted piezo-resistive elements are configured in a bridge form. The bridge elements are laser trimmed to unity ratio of corresponding arms.

The sensing wafer is suitably protected by 316 SS diaphragm. When the diaphragm is subjected to a pressure, the stress on silicon wafer produces a strain on the deposited bridge to give an electrical output when excited by constant DC current. The sensor is temperature compensated to ensure minimal drift with ambient and process temperature changes.

The mV output signal of the sensor is suitably conditioned to generate the 4-20mA output current proportional to pressure. The minimum voltage compliance is 9VDC.

INSTALLATION INSTRUCTIONS

K-702 Pressure Transmitter can be installed directly on to the pressure line. 2" pipe mounting option is also possible for which necessary mounting brackets with clamps are to be used. The process pressure connection can either be 1/2"NPTM or 1/4"NPTF. Both these threads are provided on the instrument for user convenience.

Use a 32mm A/F wrench at the hexagonal portion of the process connection to fix the transmitter on the pressure line.

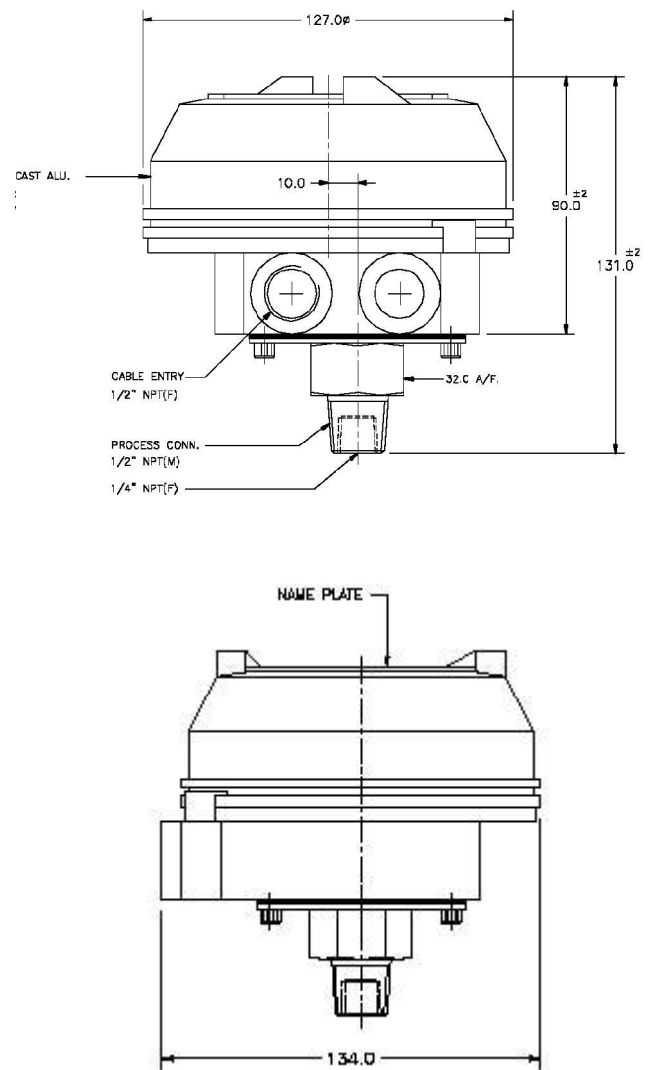
* CAUTION

Do not rotate the unit by holding the casting which may cause irreparable damage to the mechanical mounting of the pressure sensor and also to the internal wiring from the sensor to electronics. Warranty service shall not be applicable in cases of violation.

Important installation notes:

- Enclosure is W/P only when all entries and joints are suitably sealed.
- Use certified cable gland when not supplied by SWITZER.
- Mounting plate and clamps not supplied for Direct Mounting option.

Fig-1: Dimensions



COVER LOCK

The instrument is provided with cover lock facility to enable it to be used for weatherproof or flameproof applications. The cover is fully threaded onto the body and locked in position for proper sealing with o-ring to ensure compliance to weatherproof and flameproof requirements.

The cover is locked in position when the instrument is shipped after manufacturing.

Unlock method:

- Loosen the lock screw.
- Rotate the lock by 180° and ensure that tongue of lock is out of the cover groove.
- Unscrew cover in anticlockwise direction to access internals of the instrument.

Lock method:

- Fix the cover and rotate clockwise to fully seat on body and seal the o-ring.
- Rotate lock and ensure that the tongue of lock enters the groove on cover.
- Tighten the cover lock screw.

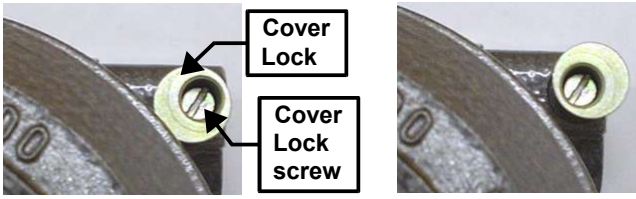


Fig-2: Cover Locked

Fig-3: Cover Unlocked

WIRING INSTRUCTION

The terminals for electrical connection are located on the PCB inside the enclosure. Terminals can be accessed upon removal of the cover. The terminals used are screw clamp type and can accommodate a maximum of 2.5mm² wires. See figure at next page for terminal location and polarity.

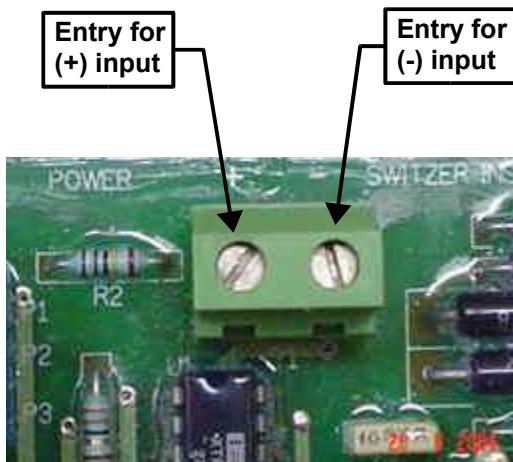
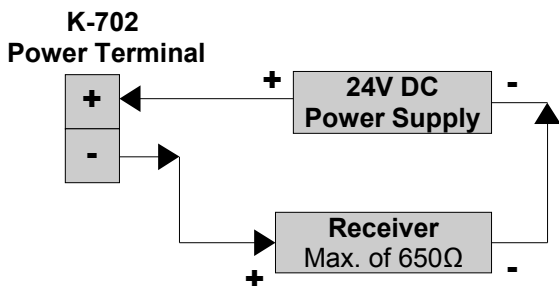


Fig-4: Wiring connection drawing



CALIBRATION INSTRUCTION

The pressure transmitters are factory calibrated to the required range and hence normally do not require any recalibration during installation. The following calibration procedure can be followed during any maintenance activity. Proper tools are to be used during calibration to ensure trouble free and precise performance of the transmitter.

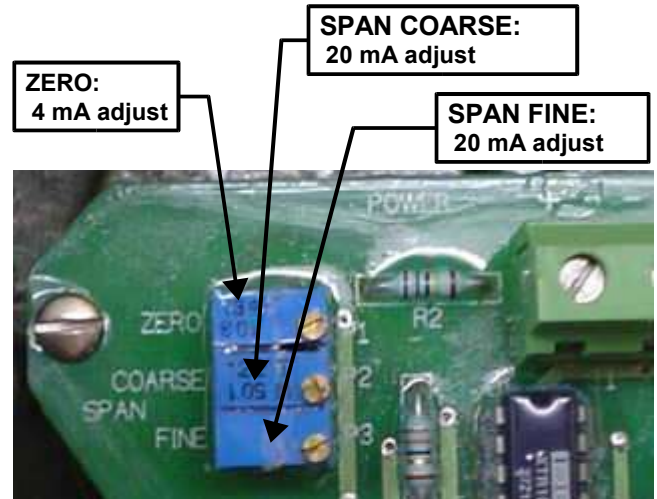
Equipment required

1. A pressure source for the required range of the transmitter with an accuracy of 0.1% or better.
2. A 24VDC supply.
3. A 3-1/2 digit multimeter with 20.00 mA current range.

Calibration adjustment locations

See below picture for the potentiometer locations for calibration adjustments. 3 pots are provided for calibration.

1. ZERO for adjustment of 4 mA output
2. SPAN COARSE for coarse adjustment of 20 mA output
3. SPAN FINE for fine adjustment of 20 mA output



Procedure

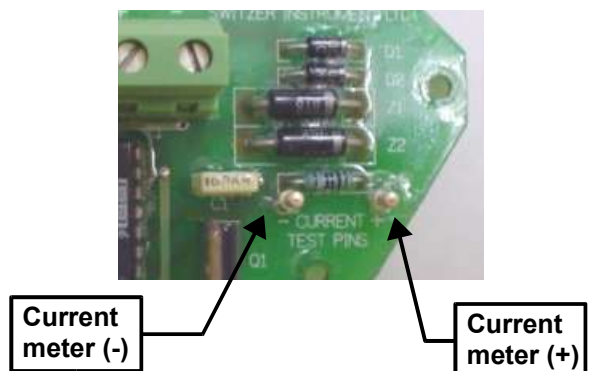
1. Unscrew the cover of the transmitter housing.
2. Make the necessary pressure connection to the transmitter in the external 1/2" NPTM or internal 1/4" NPTF appropriately.
3. Initially vent the pressure to atmosphere.
4. Connect the supply wires to the terminals marked (+) and (-) appropriately as per the wiring diagram. This will also carry the 4-20 mA current output. The output current can be measured in 2 ways.

(a) By Current meter in Series with Transmitter

This is to be used during all calibration purpose for precise output setting corresponding to input pressure.

(b) By connecting Current meter to the internal current test pins

This method enables to measure the current output without disturbing or disconnecting the supply wire by using the terminal posts provided. This is provided just to ensure that current is flowing from the transmitter during any checking or testing purpose. ***This method is not recommended to be used for calibration purpose.*** See picture below for location and connection polarity.



5. Without applying any pressure, adjust the ZERO pot, for multimeter to read 4.00 mA.
6. Apply a pressure of 99% of the full range pressure, marked on the name plate of the transmitter.
7. Adjust the COARSE SPAN pot for the meter to read between 19.79 mA and 19.89 mA.
8. Trim the FINE SPAN pot for the precise output current of 19.84 mA.
9. Vent the pressure to atmosphere and check for 4.00 mA. Trim if necessary.
10. Check at various intermediate values for linearity.
11. This ends calibration.

TECHNICAL SPECIFICATIONS

ELECTRICAL

Output	4-20 mA
Range (in bar)	0 to 1, 2, 3.5, 7, 20, 35, 70, 200, 350
Power Supply	11 to 30 VDC, 24VDC nominal
Accuracy	± 0.2% calibrated span
Repeatability & Hysteresis	± 0.05% calibrated span
Output current limit	27mA (max.); 2.5mA (min.)
Load capability	650 ohms @ 24VDC
Zero temp co-eff.	± 0.03%/°C of full scale wrt 25 °C
Span temp co-eff.	± 0.03%/°C of full scale wrt 25 °C
Turn down ratio	4:1
Maximum pressure	2 times the rated pressure
Response time	< 100 m secs
Electrical connection	1/2" NPT(F)

MECHANICAL

Process connection	1/2" NPT(M)-External and 1/4" NPT(F)-Internal
Sensor diaphragm	316 SS
Enclosure	GK die cast aluminum Weatherproof to IP:66 of IS:2147 Flameproof to Gr.II-A, II-B & II-C of IS:2148. BIS certified
Mounting	Direct on line; 2" pipe optional
Overall dimensions	127 x 131 x 134 mm

TEMPERATURE LIMITS

Process	0°C to 100°C
Ambient	0°C to 70°C

MAINTENANCE INSTRUCTIONS:

There are no user serviceable parts in this transmitter. The transmitter may need only a recalibration occasionally. Recalibration can be done at site by following the procedure as described earlier.

Keep the sensor port clean to enable accurate measurement. If there is any clogging of the port with any debris, remove it gently with a tweezer. Do not use any sharp tool that can damage the diaphragm. Non-corrosive solvents can be used for cleaning the pressure port such as iso-propyl alcohol.

Return instrument to factory if there is any malfunction.